



FAA
Mission Needs Statement
(Draft)
for
Small Aircraft Transportation System
(SATS)

June 21, 1999



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Briefing Overview

- **Objective**
- **Background**
 - **FAA Acquisition Management System**
 - **Baseline 2001**
- **Needed Capabilities**
 - **Aircraft**
 - **NAS Infrastructure**
 - **Airports**
- **Benefits / Impacts**
- **Next Steps**



Objective

Informational Brief FAA's Small Aircraft Transportation System Mission Need Statement. (Draft)

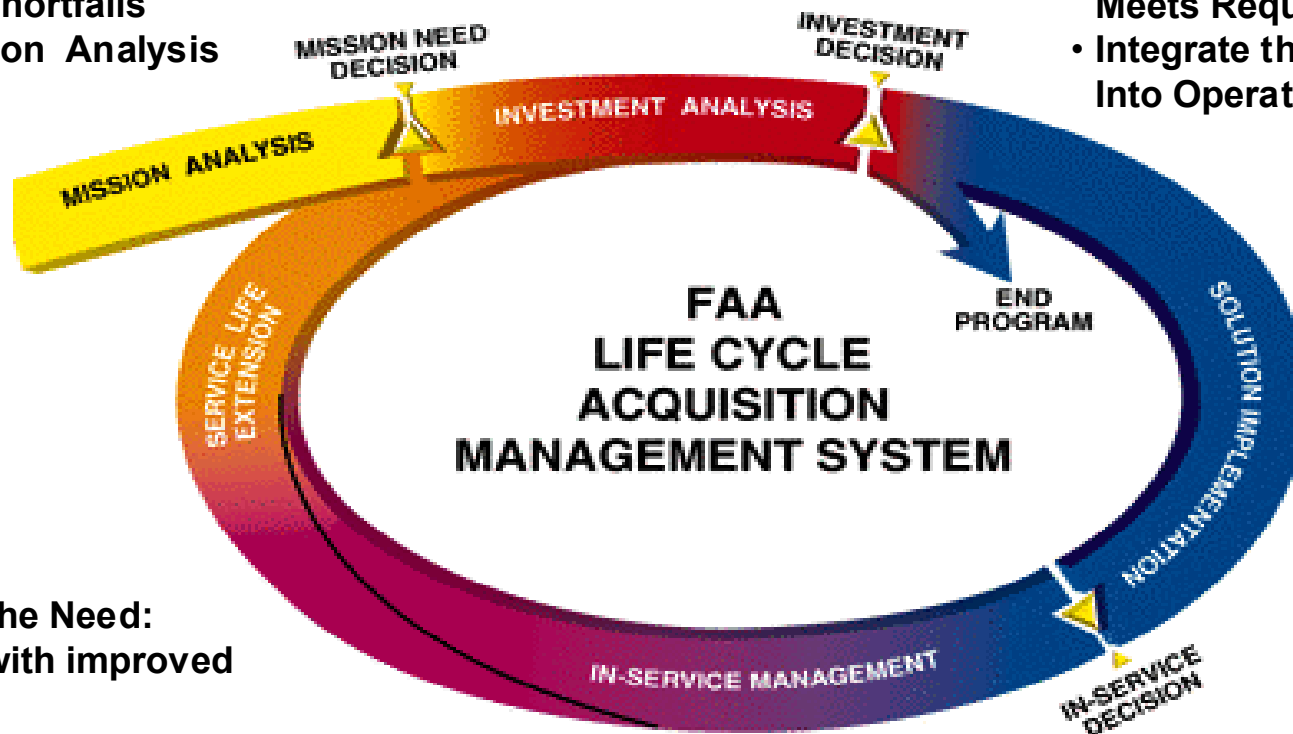


Acquisition Management System

- Identify Service Capabilities Shortfalls
- Conduct Mission Analysis

- Requirements Identification
- Selection of Alternatives
- Affordability Assessment

- Plan the Acquisition
- Acquire Solution That Meets Requirements
- Integrate the Solution Into Operations

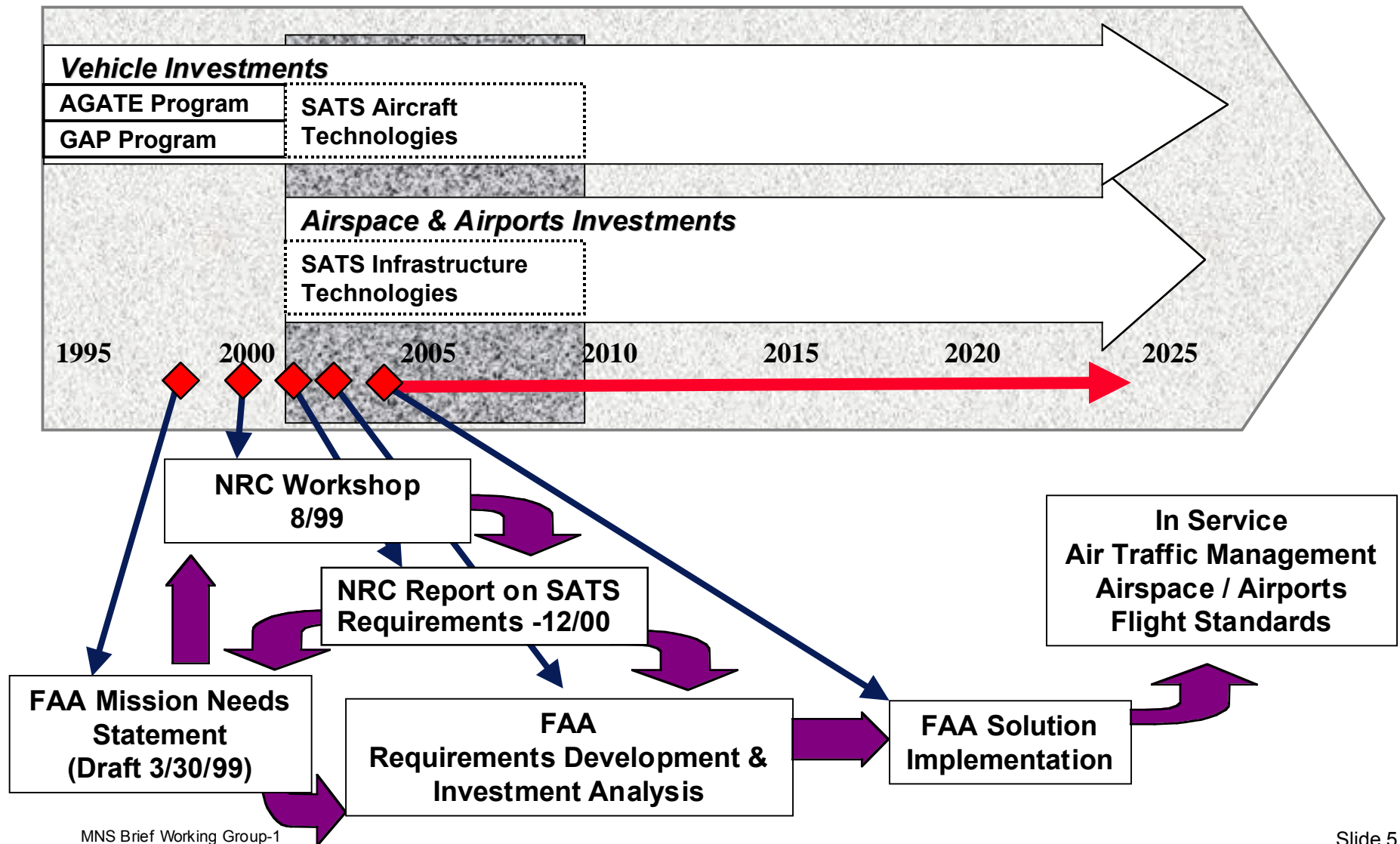


- Revalidate the Need:
 - Replace with improved capability
 - Extend service life
 - Decommission

- Operate and Sustain Solution
- Monitor Performance and Cost, Identify Trends in Capability



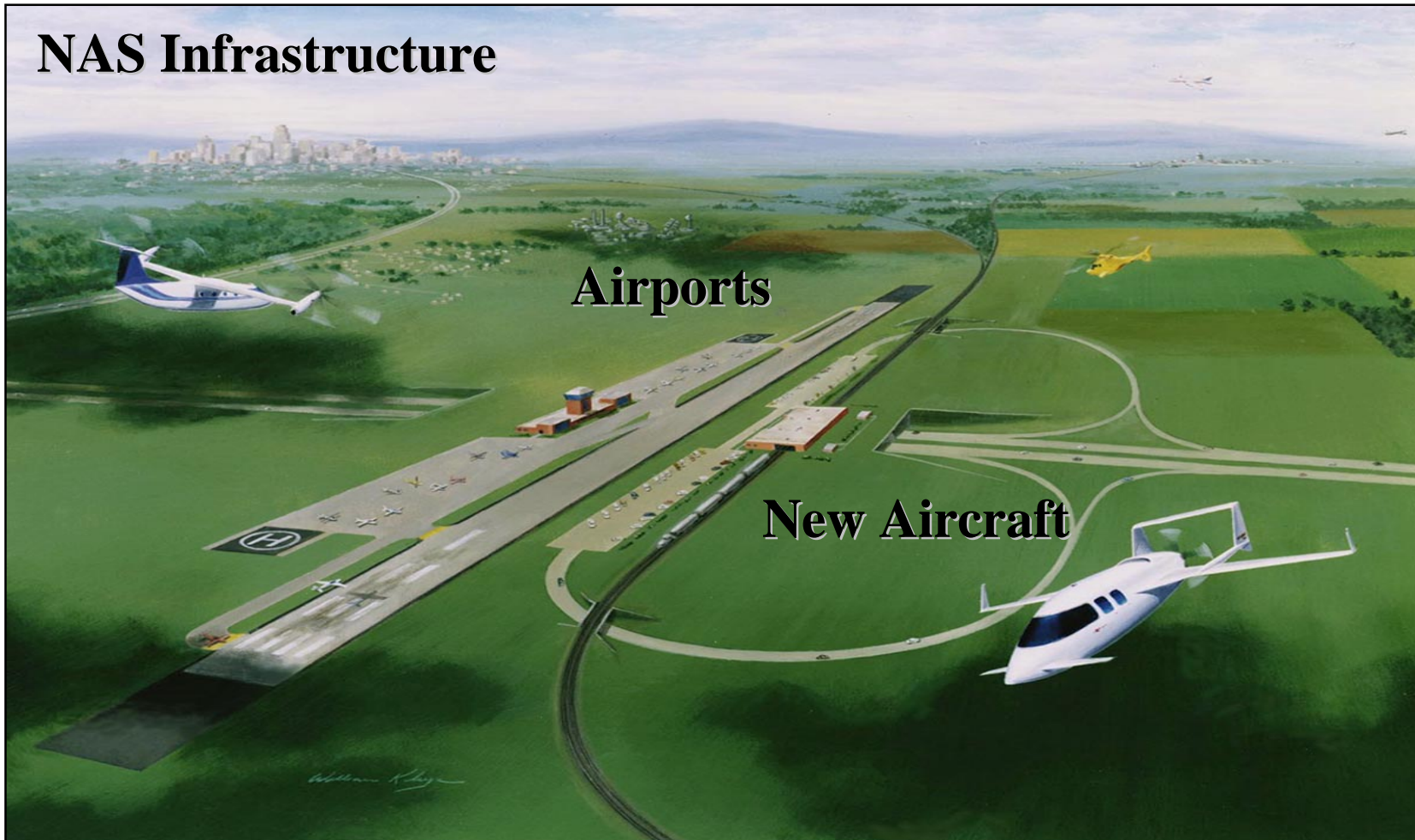
SATS Roadmap





SATS Needed Capability

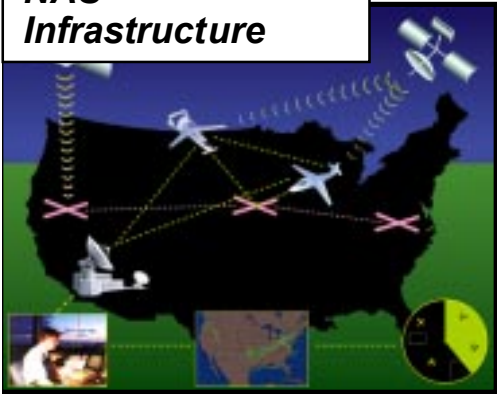
NAS Infrastructure





Technology Areas

**NAS
Infrastructure**



**Flight Deck Operations
& Avionics**



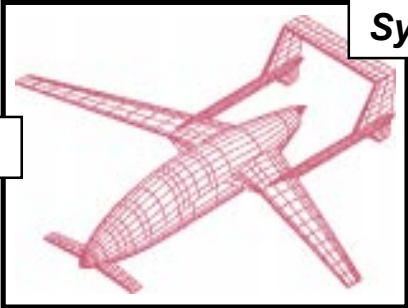
Small Aircraft Transportation System

**Pilot
Training**



**Propulsion
Systems**

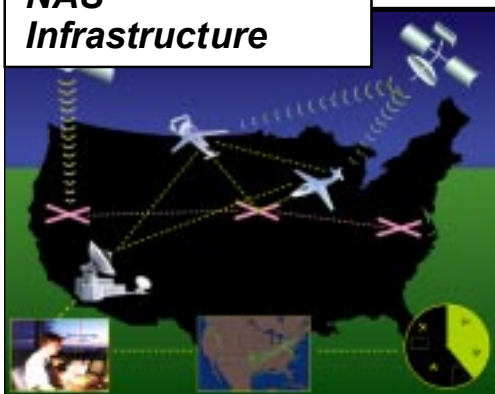
Airframe Systems





Baseline Technology -- 2001

NAS Infrastructure



- Begin WAAS deployment (CAT I approaches)
- Air-to-air surveillance introduced
- Initial FIS provided WX from commercial vendors
- Satellite-based Comm-Nav-Surveillance

Flight Deck Operations & Avionics



- COTS Processors, Operating Sys, Displays
- Solid state Attitude-Heading-Ref-System
- Affordable databus
- PFD, MFD
- Icing "Avoid & Exit"
- Single-lever power control
- VDL Mode 2 data radios
- FAR-JAR Harmonization underway

Pilot Training



- Unified Instrument-private curriculum
- 25% savings in time and cost

Small Aircraft Transportation System

Airframe Systems

- Affordable composites
- Crashworthiness
- Affordable ice protection
- Integrated lightning protection



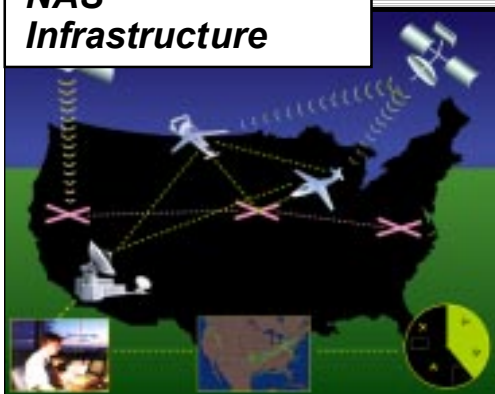
Propulsion Systems

- New Small Turbine
- New Compression-Ignition Engine
- Quiet propellers



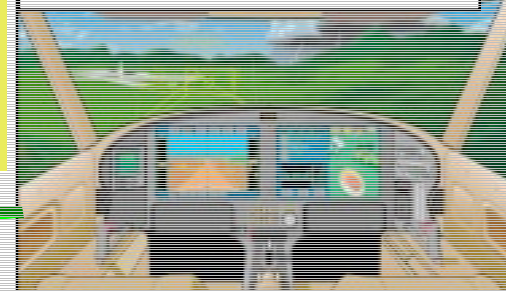
Baseline Technology -- 2001

NAS Infrastructure



- Begin WAAS deployment (CAT I approaches)
- Air-to-air surveillance introduced
- Initial FIS provided WX from commercial vendors
- Satellite-based Comm-Nav-Surveillance

Flight Deck Operations & Avionics



- COTS Processors, Operating Sys, Displays
- Solid state Attitude-Heading-Ref-System
- Affordable databus
- PFD, MFD
- Icing "Avoid & Exit"
- Single-lever power control
- VDL Mode 2 data radios
- FAR-JAR Harmonization underway

Pilot Training



- Unified Instrument-private curriculum
- 25% savings in time and cost

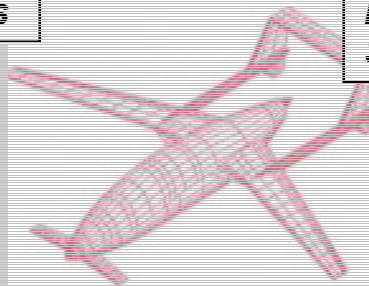
Small Aircraft Transportation System

Airframe Systems

- Affordable composites
- Crashworthiness
- Affordable ice protection
- Integrated lightning protection

Propulsion Systems

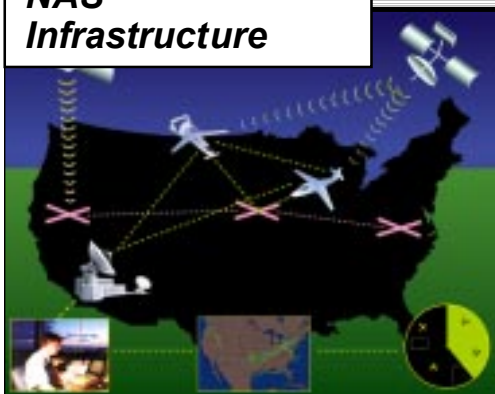
- New Small Turbine
- New Compression-Ignition Engine
- Quiet propellers





State of the Art -- 2007

NAS Infrastructure



- WAAS completed (Increased CAT I approaches)
- LAAS deployed (CAT I/II/III approaches)
- ADS-B available for user equipage
- Real-time FIS including WX, SUA, & NOTAMS
- Deployment of Next generation Comm-Nav-Surveillance equipment

Single-Crew Flight Deck Systems & Operations



- Decoupled controls
- Envelop protection
- Ride quality
- Affordable software certification
- Affordable HUD/Enhanced/synthetic vision
- VDL Mode 3 data radios

Pilot Training



- Onboard Cyber-Tutor
- Internet Training
- 50% savings in time and cost

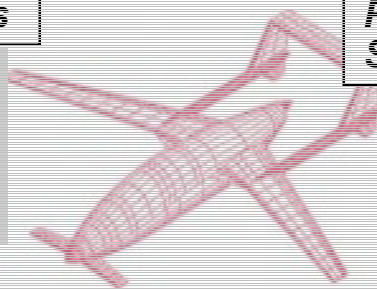
Small Aircraft Transportation System

Airframe Systems

- < \$30 per lb composites, assembled
- Optimized ice, lightning, & crash protection

Propulsion Systems

- < \$50,000 Turbine
- < \$15,000 Compression-Ignition Engine
- Quiet propulsion





Needed Capability -- 2007

New Aircraft

• *FAA's responsibilities in the aircraft area involve policy, certification, and the implementation of supportive air traffic procedures and capabilities in the NAS.*

Needed Capability

- Regulation and rule changes to support design, production & certification of new aircraft systems
- Policy & procedures to utilize SATS technology aircraft
- Ability to accurately determine & broadcast current location
- Means to separate from other aircraft in remote areas
- Near all-weather operations
- In-flight re-planning
- Comply with laws, regulations, & policies



Current & Planned Capability

- Address Certification Process & Procedures
- Cooperation as effective service provider
- Participates as a partner in the public-private alliances seeking to advance state-of-the-art.

Shortfalls

- Implementation of SATS supportive air traffic management procedures
- Streamlined aircraft/avionics certification process
- Expedited pilot training & evaluation based on SATS technologies



Needed Capability -- 2007

NAS Infrastructure

- Accommodate SATS concept of operations by providing communications, navigation, and surveillance procedures and weather capabilities.

Needed Capability

- Information on traffic flow & system status
- Systems to permit near all-weather operations in remote areas at low altitudes
- Expanded traffic flow management
- Reliable Communications from Surface Up
- Means to Separate Aircraft in Remote Areas
- Near All-Weather Operations
- Accommodate mixed equipage aircraft



Current & Planned Capability

- Flight Standards Service to ensure flight procedures are developed and validated
- New Decision Support Tools to increase capacity & efficiency of NAS

Shortfalls

- Analysis of effect of increased volume of SATS aircraft on traffic flow and ATC system
- Streamlined aircraft/avionics certification process
- ATC system ability to utilization of SATS technology
- SATS operating policy guidance
- Airspace designed to support SATS operating concept



Needed Capability -- 2007

Airports

- *Ensured accessibility to an expanded service area with higher utility in near all weather conditions*

Needed Capability

- Marked & lighted for 24/7 operations
- Systems to permit near all-weather operations
- Instrument approach capability
- Meet all environmental regulations
- Available to all category aircraft
- Lower cost approach lighting systems



MNS Brief Working Group-1

Current & Planned Capability

- GA roadmap calls for 1,125 SATS airports by 2007
- FAA conducts approximately 138 airport master planning studies per year
- Approximately 47 infrastructure system planning studies a year

Shortfalls

- Lack of basic infrastructure at most airports
- Limited funding available for airport planning
- NAS Architecture does not highlight transition to SATS airports
- Ability to process environmental requirements in a timely manner
- NPIAS policies & processes may be inadequate for efficient & flexible development of SATS infrastructure



Benefits

- **Meet User Demand**
- **Increases capacity and efficiency of NAS**
 - Exploits Underutilized NAS Capacity
 - Augmentation to Hub-and-Spoke
 - Leverages on current NAS Architecture development
- **Supports Advances in Engine and Airframe Technology “Technology Push”**
- **Exploits Safety Enhancements Inherent in SATS**
- **Enhances Personal / Business travel and development**
- **Supports the further growth of National productivity and increases overall National quality of life**
- **Supports ONE DOT strategy for intermodal transportation**



Next Steps

- **Attain JRC Commitment**
- **Support NRC/TRB Study**
- **Establish Research Areas**
 - Procedural requirements
 - Airspace needs
 - Infrastructure requirements
 - Certification process
- **Reinsert SATS program in FAA AMS process**
 - JRC 1 -- Investment analysis
- **NAS Architecture Update**